

Mental Health Disparities Following Violent Injury: A Prospective Comparison of Survivors of Violent and Nonviolent Mechanisms of Injury

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ABSTRACT

Aim and background: Violence is a global crisis causing deleterious effects on survivors and the health of communities. Yet, there is limited prospective research examining the mental health of violence-related injury survivors. Longitudinally assessing differences in mental health outcomes following violence-related and nonviolent injuries can inform what comprehensive approaches to recovery are needed to reduce disparities following violence.

Materials and methods: Participants ($N = 245$) presenting to a midwestern level 1 trauma center following injury completed measures of posttraumatic stress disorder [PTSD symptom checklist for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)], depression, anxiety, stress, [Depression, Anxiety, and Stress Scale (DASS-21)] posttrauma and 6 months later.

Results: Analyses of variance revealed that violence-related injury patients experienced chronic or worsening symptoms of PTSD, depression, anxiety, and stress levels, whereas nonviolently injured patients had less severe symptoms that diminished over time.

Conclusion: Compared with nonviolent injury patients, patients with violence-related injuries have poorer mental health, regardless of injury severity. Further, this disparity appears to grow by 6 months, which has significant implications regarding individual and community health. Screening and effective treatment of mental health issues among violence survivors is necessary to address comprehensive needs and reduce the overall impact of violence.

Clinical significance: Violence-related injury survivors are at risk for psychopathology, which impacts recovery, quality of life and limits, and reengagement with society. Tertiary prevention efforts must account for the role of mental health when supporting survivors.

Keywords: Traumatic injury, Violence, Posttraumatic stress disorder, Mental health.

RESUMEN

Objetivos y antecedentes: La violencia es una crisis global que causa efectos nocivos en los sobrevivientes y en la salud de las comunidades. Sin embargo, existe un límite de investigaciones prospectivas sobre la examinación de la salud mental de sobrevivientes de lesiones causadas por violencia. Evaluando longitudinalmente por diferencias en los resultados de salud mental después de lesiones violentas y sin violencia puede informar cuales enfoques completos de recuperación son necesarios por reducir disparidades después de violencia.

Materiales y métodos: Participantes ($N = 245$) presentando después de una lesión a un centro de trauma de nivel 1 en el mediooeste de los EEUU completaron encuestas sobre el trastorno de estrés posttraumático (TEPT; PTSD Symptom Checklist for DSM-5), depresión, ansiedad, y estrés (Depression, Anxiety, and Stress Scale, DASS-21) post-trauma y 6 meses después.

Resultados: Análisis de varianza mostró que pacientes con lesiones causadas por violencia experimentaron síntomas crónicos o empeorados de TEPT, depresión, ansiedad y niveles de estrés; mientras pacientes con lesiones no causadas por violencia tenía síntomas menos severos que han disminuida durante el tiempo.

Conclusión: Comparada a pacientes con lesiones no causadas por violencia, pacientes con lesiones causadas por violencia tenía peor salud mental, independiente de la severidad de lesión. Además, parece que la disparidad crece a los 6 meses después, que tiene implicaciones significativas para la salud de la persona y la comunidad. Medidas de cribado y tratamientos efectivos para la salud mental de sobrevivientes de violencia es necesario para considerar las necesidades comprensivas y reducir el impacto en general de la violencia.

Importancia clínica: Sobrevivientes de lesiones causadas por violencia están en riesgo de tener psicopatología, que impacta la recuperación, calidad de vida, y limita la participación con la sociedad. El esfuerzo de prevención terciario debe considerar la función de la salud mental para apoyar sobrevivientes.

Palabras clave: Lesión traumática, Violencia, PTSD, Salud mental.

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INTRODUCTION

Violence and resulting traumatic injuries contribute to substantial morbidity and mortality, with over 2.8 million United States emergency department (ED) visits annually for assaultive injuries.¹ Violence spreads cyclically within communities like a contagious disease,² underscoring violence prevention as a vital public health

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priority. In fact, providing comprehensive care during the period following an initially violent trauma may also prevent the recurrence of the injury or the spread of further violence.³ Subsequently, trauma care settings provide a critical opportunity for tertiary prevention efforts to mitigate adverse outcomes and prevent the further spread of violence. That said, previous investigations have focused only on specific subsets of intentionally injured patients, such as victims of sexual assault, lacked appropriate control groups, or have other methodological limitations.^{4,5} Examining recovery outcomes in recently injured trauma patients can elucidate the specific impacts of intentional violence on both physical and emotional health trajectories. This critical window provides an opportunity to screen patients at risk of poor recovery and provide targeted interventions to reduce the overall impact of violence in our communities.

Looking explicitly at violence-related injury necessitating medical care, in a recent review, Ophuis et al.⁴ identified wide ranges of stress disorders and depression following patient presentation to the ED. Specifically, acute stress disorder occurred at rates between 11.7 and 40%, with subsequent posttraumatic stress disorder (PTSD) varying widely between 1.9 and 60.9%. Further, depression examined 1-month postassault was experienced by 3.0–35.3% of samples. This heterogeneity was attributed to the use of variable diagnostic instruments across studies, but ultimately, findings support the presence of stress disorders and depression in the months following an assaultive injury. Yet the posttraumatic experience following a violence-related injury may have important differences from nonviolent injury, and it may include a constellation of ongoing stressors, such as interactions with the perpetrator and/or the criminal justice system. Methodological limitations, as described above, may contribute to these discordant findings. A better understanding of potential disparities in recovery trajectories based on the mechanism of injury can inform tertiary prevention efforts within trauma care and improve long-term well-being.

This study aimed to longitudinally assess physical and emotional outcomes after traumatic injury, comparing individuals who experienced intentional violence-related injuries to those experiencing nonviolent trauma. We hypothesized that violence-related injuries would predict poorer mental health recovery even when controlling for relevant factors like injury severity.

MATERIALS AND METHODS

Participants and Procedure

Adults ($N = 413$) were recruited from the Midwestern level 1 trauma center. This combined data from two studies occurring at the trauma center examining mental health recovery after traumatic injury (for additional details, see deRoon-Cassini et al.).⁶ Participants were recruited in the ED or during hospitalization and provided information on the purpose and the procedure of the study. Inclusion criteria were as follows: (1) age 18 years or older; (2) Glasgow Coma Scale of >13 on arrival; (3) nonself-inflicted mechanism of injury; and (4) ability to communicate in English. The larger studies recruited participants with all mechanisms of injuries (MOIs), and the current investigation categorized mechanisms based on violence-related MOI (e.g., gunshot wound, assault) to a nonassaultive mechanism (e.g., motor vehicle collision, falls). Each participant consented, and then a battery of measures was completed by each participant at baseline. Participants then returned 6 months postinjury and completed a second battery of questionnaires. A total of 245 participants completed their 6-month follow-up. See [Flowchart 1](#) for recruitment, loss to follow-up, and

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retention. Studies were approved by the Institutional Review Board. Additionally, both studies were funded by the National Institute of Mental Health, and the funding organization was not involved in study design, data collection, or analyses.

Measures

Self-report Measures

PTSD symptoms: The PTSD checklist (PCL-5)⁷ is a self-report measure that evaluates symptoms of PTSD. There are 20 items assessing symptom severity on a 5-point Likert scale from 0 (“not at all”) to 4 (“extremely”) in the past month. Participants endorse symptom severity based on the injury related to their visit to the ED when completing the measure. Sum scores range from 0 to 80, with higher values indicative of greater symptom severity and a cut score of 30 suggestive of PTSD in an injured population.⁸ The PCL-5 has satisfactory internal consistency, test-retest reliability, and validity.⁷
Mental health symptoms postinjury: The Depression, Anxiety, and Stress Scale (DASS-21)⁹ is a 21-item self-report measure that assesses the common symptoms of depression, anxiety, and stress levels. Participants endorse symptom severity on a four-point Likert scale from 0 (“did not apply to me at all”) to 3 (“applied to me very much, or most of the time”). Scores are totaled for each subscale, with greater scores suggesting greater symptomatology and moderate symptoms, starting at 7 for depression, 6 for anxiety, and 10 for stress.¹⁰ The DASS-21 has satisfactory psychometric properties, including in clinical settings.¹⁰

Data Analytic Plan

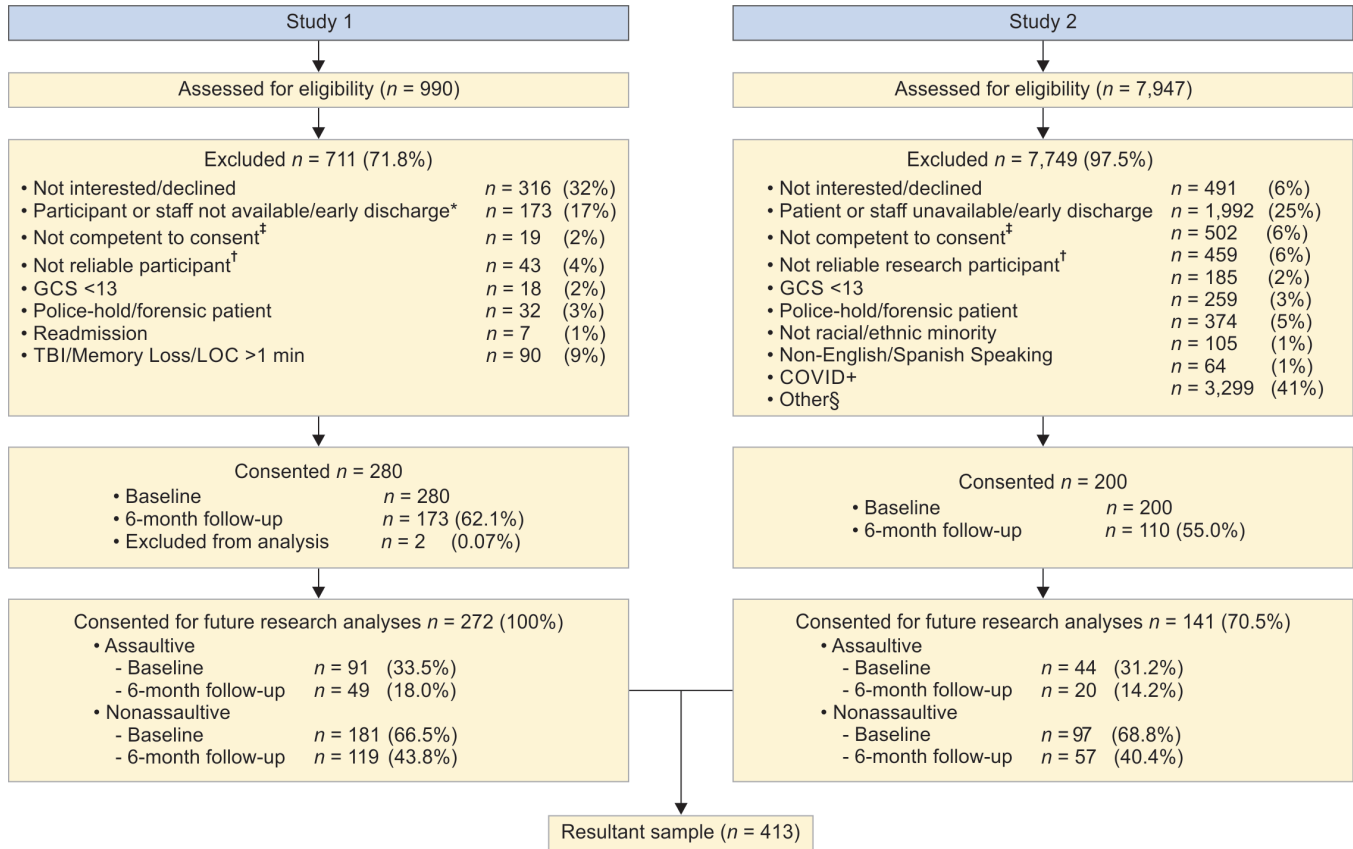
Descriptive statistics were computed, utilizing percentages for categorical variables and means and standard deviations for continuous variables ([Fig. 1](#)). To elucidate differences across mental health, stress, and health-related quality of life outcomes based on MOI, four 2 (time point: baseline, 6-month) \times 2 (MOI: violent vs nonviolent) mixed methods analysis of variance (ANOVA) examined whether violence-related injury led to greater self-reported PTSD, anxiety, depression, and stress levels. Covariates included gender, age, and injury severity score (ISS).

RESULTS

The average age of the participants was 39.17 [standard deviation (SD) = 15.36], and 290 (68.1%) were male. A total of 37.0% self-identified as White/European American, 46.6% as Black American, 15.0% as Hispanic or Latinx. A total of 32% experienced assaultive injuries, and 68% were nonassaultive injuries.

One 2 \times 2 ANOVA exploring PTSD symptoms showed a significant interaction effect of MOI by time [$F(1, 219) = 9.43$,

Flowchart 1: CONSORT diagram; *, for example, participants receiving care with family visitors and/or discharged early; †, for example, inability to communicate due to injury, significant substance abuse, inappropriate with staff, vision/hearing impaired, poor historian, combative; ‡, for example, active psychosis, altered mental status, active suicidal ideation, dementia; §, <18 years old, expired inpatient, enrolled in the competing study, Injured Trauma Survivor Screen risk negative, nontraumatic injury, readmission, pregnant, injury with suicidal intent, injury occurred >2 weeks; ¶, that is, consented to data usage for future research studies *via* databanking/repository/warehouse; TBI, traumatic brain injury; GCS, Glasgow Coma Score



$p = 0.002$, $\eta^2 = 0.041$, power = 0.86]. Results showed that individuals who experienced violence-related injury had increased symptoms from time 1 ($M = 24.11$, $SD = 18.49$) to time 2 ($M = 33.87$, $SD = 20.19$), whereas nonviolent traumas had decreasing symptoms from time 1 ($M = 17.37$, $SD = 17.80$) to time 2 ($M = 18.01$, $SD = 20.71$). Gender and age were also significant predictors of PTSD, though they did not interact with time.

One 2×2 ANOVA exploring anxiety symptoms showed a significant interaction effect of MOI by time [$F(1, 218) = 8.10$, $p = 0.005$, $\eta^2 = 0.036$, power = 0.81]. Results showed that individuals who experienced violence-related injury had stable symptoms from time 1 ($M = 8.01$, $SD = 7.52$) to time 2 ($M = 8.52$, $SD = 9.53$), whereas nonviolent traumas had decreasing symptoms from time 1 ($M = 6.97$, $SD = 7.89$) to time 2 ($M = 4.74$, $SD = 7.35$). Gender, age, and ISS had significant main effects, though no interaction effect with time.

Regarding stress, a 2×2 ANOVA exploring self-reported stress showed a significant interaction effect of MOI by time [$F(1, 218) = 13.17$, $p < 0.001$, $\eta^2 = 0.057$, power = 0.95]. Results showed that individuals who experienced violence-related trauma had increased stress from time 1 ($M = 7.73$, $SD = 7.59$) to time 2 ($M = 10.57$, $SD = 9.77$), whereas nonviolent traumas had relatively stable stress levels from time 1 ($M = 7.43$, $SD = 7.49$) to time 2 ($M = 6.31$, $SD = 7.54$). Gender, age, and ISS had significant main effects, though no interaction effect with time. Lastly, the 2×2 ANOVA examining the

effect of time and MOI on depressive symptoms demonstrated a trending interaction effect of time by MOI, though it did not reach the threshold for statistical significance [$F(1, 218) = 3.49$, $p = 0.043$].

DISCUSSION

The aim of the current study was to evaluate the impact of violence-related injury on recovery relative to the impact of nonviolent traumas. Violence is a disease that carries significant ramifications for the health of individuals and communities. Using a public health approach, preventing violence, and reducing the impact of violence requires a comprehensive approach. One method of doing so is by ensuring we understand the complete impact of violence on those who experience it. Results showed that following injury, PTSD, anxiety, and stress levels for violence-related injury survivors remained stable or increased from baseline to 6 months and were consistently higher than those who experienced nonviolent injury. Further, violence-related survivors had higher levels of depression overall compared to nonviolent injury survivors. Conversely, those experiencing nonviolent injury tended to have decreasing symptoms or symptoms that remained low over time, which is congruent with previous work suggesting many trauma survivors have minimal symptoms (deRoon-Cassini et al., trajectories).

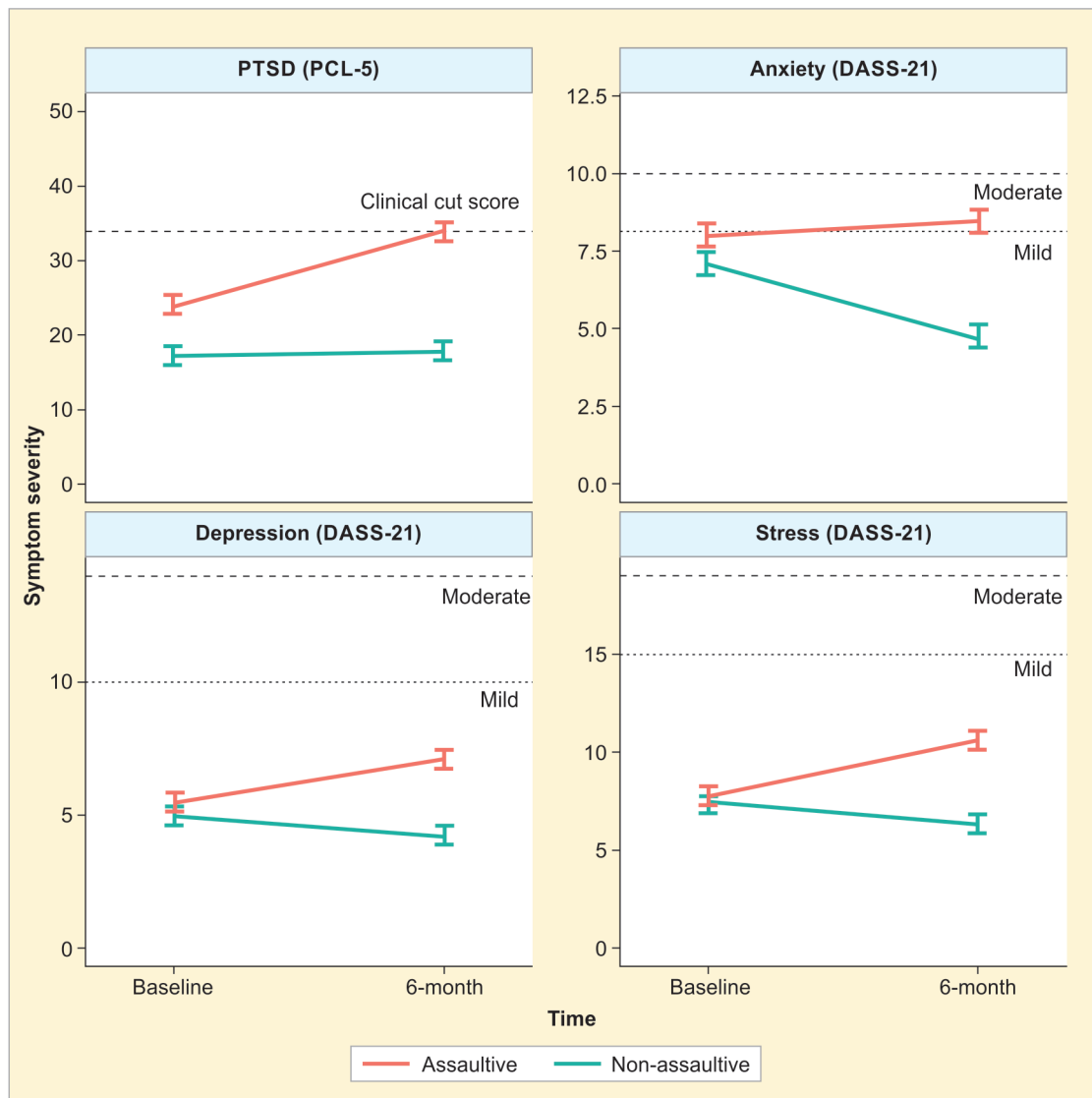


Fig. 1: Mental health symptoms across time for violence-related and nonviolent injury; included are the published recommended cutoffs for PTSD, depression, anxiety, and stress based on validation studies

The need to understand the impact of violence is vital, particularly as violence-related trauma also differentially impacts communities.^{2,3} There are increasing numbers of people carrying the physical and mental health burden of their violence-related injuries.^{11,12} The growing evidence, including that from the current investigation, highlights barriers to full recovery and reintegration in the community after the violence, underscoring the need for trauma centers and community organizations to facilitate the path to recovery holistically.¹³⁻¹⁶ Consistently, violence-related injury survivors endorsed not only greater PTSD symptom severity, a commonly examined mental health outcome after trauma, but also a wider spectrum of psychopathology (i.e., anxiety, depression, and stress).

Even when adjusting for injury severity, violence-related injury survivors experienced greater levels of stress compared to nonviolent injury survivors, suggesting greater difficulty managing stress in the context of recovery. Put differently, on average, the psychological well-being of survivors of violence significantly worsens over time, whereas those with other injuries tend to improve. Violence-related injury survivors have symptom

trajectories akin to a chronic PTSD trajectory, which significantly impacts the quality of life and the ability to return to baseline functioning.^{17,18} With disparities in recovery is evident even 6 months posttrauma, health systems need to treat all violence as a biopsychosocial disease.¹⁹

This work both informs and supports early assessment and intervention for violence-related injury survivors at trauma centers.^{19,20} The risks following violence-related injury, including reinjury, mortality, and spread of violence, have garnered increasing attention, with centers beginning to change practice by including hospital-based violence interruption programs.^{20,21} Yet, beyond primary prevention programs targeting violence, growing evidence calls for greater secondary and tertiary interventions for those who already experienced assaultive violence and their families. Those at greatest risk for violence already experience additional disparities related to social determinants of health, such as higher rates of poverty, noninsurance status, and neighborhood violence.^{19,21} Individuals need greater support from healthcare systems to address the vast deleterious physical and mental health outcomes thwarting recovery. The use of risk screening for adverse outcomes

like violence or perceived intentionality to determine intervention needs is vital.^{22,23}

Screening for needs can then lead to greater access to mental health resources or social services. Violence-related trauma raises unique challenges to cope and rehabilitation, including decreased engagement with healthcare and health-promoting behaviors.^{24,25} Patients may cancel appointments due to longstanding mistrust of healthcare systems or may not be as physically active in their daily lives due to fear of experiencing further violence (e.g., encountering the perpetrator while on a walk).²⁵ Without integrating mental health into trauma care, these nuances can be misperceived by the recovery team as poor engagement, likely exacerbating disparities in recovery. In reality, avoidance reflects patients contending with postviolence barriers. A lack of integrated mental health providers makes timely referrals and follow-up challenging for patients who are already experiencing the sequelae of violence.²⁶

While the current investigation extends the understanding of violence-related injury outcomes, the findings should be considered within the context of limitations. Although it is valuable to examine acute injury and recovery, the generalizability of this work is limited due to the 6-month period in the aftermath of injury. Future work should continue to explore longer-term recovery and what additional biopsychosocial factors might put someone at heightened risk for poor recovery. Similarly, there are limitations when elucidating the understanding of underlying factors driving the significant differences in outcomes based on MOI. Future work should explore what characteristics of violence (e.g., betrayal, interpersonal mistrust, exposure to community violence) may explain differences evidenced in recovery. Finally, it is possible that those who sustained violence-related injuries had worse mental and physical health prior to the event than those who experienced other injuries. Even still, if this were the case, the finding that outcomes are worse presents an opportunity for trauma centers to increase access to care to improve health outcomes and health disparities for this vulnerable patient population.

CONCLUSION

Overall, the current study demonstrates the importance of considering the significant burden of recovery that violence-related injury survivors experience across physical and mental health outcomes. Strikingly, when one sustains a physical injury from interpersonal violence, the risk for negative outcomes is alarmingly high and disparate from other injuries. Violence survivors are an especially at-risk population, necessitating higher levels of comprehensive care from the health systems that serve them.

Clinical Significance

This study demonstrates that survivors of violence-related injury report more severe mental health concerns than their nonviolent injury counterparts. Healthcare providers working with these patients should monitor the potential risk of psychopathology and provide appropriate referrals. There is a significant need for policy changes at trauma centers, such as developing standardized screening for mental health and building capacity for integrated mental health providers. Further, given the variability of available resources and funding, shifts in prioritizing psychosocial care and peer support resources in medical settings would address these mental health disparities.

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